REMARKS

The Office Action dated June 30, 2006, has been received and carefully noted. The following remarks are submitted as a full and complete response thereto. Claims 1-39 are presently pending and submitted for consideration.

Claims 9-13, 1-18, 21-28 and 33-39 were objected to as being based upon a rejected base claim but would be allowable if rewritten in independent form. Applicant wishes to thank the Examiner for indicating the allowability of claims 9-13, 1-18, 21-28 and 33-39. However, based on the reasons outlined below, Applicant requests that each of claims 9-13, 1-18, 21-28 and 33-39 be allowed in their present form.

Claims 1-8, 14, and 29-32 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,798,743 to Ma in view of U.S. Patent No. 6,532,554 to Kakadia. According to the Office Action, Ma teaches all of the elements of claims 1-8, 14, and 29-32 except for teaching a module that determines whether or not to wrap outgoing packets with control information. Kakadia is cited as curing the deficiencies of Ma. The rejection is traversed as being based on references that neither teach nor suggest the novel combination of features clearly recited in any of claims 1-8, 14, and 29-32.

Claim 1, upon which claims 2-18 depend, recites a cable modem termination system that includes a media access controller and at least one physical layer transceiver in connection with said media access controller for receiving and transmitting data. The system also includes a CPU interface configured to communicate with a CPU and a

network functions module in communication with said media access controller and said CPU interface. The network functions module includes an upstream flow module for providing quality of service for upstream packet flows, a bridging and routing module for performing bridging of packets to a downstream flow module and for routing the packets to and from a bus and the downstream flow module for providing quality of service for incoming packet flows and for wrapping outgoing packets. The downstream flow module includes a rule module. The network functions module is configured to conduct flow management and classification functions upon packets traveling through said media access controller. The downstream flow module determines whether or not to wrap outgoing packets with control information

Claim 29, upon which claims 30-39 depend, recites a method for processing including the steps of receiving a packet in a media access controller and transmitting the packet to a network functions module. The method also includes providing quality of service for upstream packet flows in an upstream flow module and performing bridging of the packet to a downstream flow module and routing the packet to and from a bus in a bridging and routing module. The method further includes the steps of implementing flow management and classification functions on the packet, wrapping an outgoing packet in a downstream flow module, based on a determination of whether or not to wrap outgoing packets with control information and forwarding the packet to an appropriate destination.

As will be discussed below, the cited prior art references of Ma and Kakadia fail to disclose or suggest the elements of claims 1-8, 14 and 29-32.

As presented in a previous response, Ma discloses a packet preprocessing and prioritization technique to significantly reduce end-to-end processing delay associated with routing high priority packets. Figure 8 shows a router in which the preprocessing and prioritization technique may be implemented. The router includes multiple input interfaces that may have one or more queued packets, each of which may have a different QOS priority level. When the packet enters the router, it is dequeued from the input interface and decapsulated by a decapsulation block 802 and classified by block 804 to determine the priority level. The router also includes an intermediate structure for storing non-delay sensitive packets. As such, the router separates overall packet processing into a preprocessing phase during which delay sensitive packets are fully processed and non delay sensitive packets are stored in the intermediate structure and an intermediate queue processing phase during which intermediate packets are retrieved and processed. Col. 9, line 16-Col. 10, line 67. Hence, preprocessing/phase I includes decapsulation and classification to identify the associated priority level of each processed packet to determine whether or not the packet is delay sensitive. Col. 11, lines 10-16.

Ma further teaches that if the packet is determined to be delay sensitive, the packet is immediately and fully processed sufficiently to be routed to at least one output interface queue. Full processing may includes forwarding information (FIB) lookup, QoS processing and/or encapsulation and routing the fully processed packet to an

appropriate output interface queue within data structure 810. Once all input interfaces have been checked for packets to preprocess, the router switches to phase II where intermediate packets are fully processed. Col. 11, lines 43-49 and Col. 14, lines 52-65. During full processing of the packet, the appropriate output interface is determined at block 808. The packet is then encapsulated and routed to the output interface queue 810. Col. 14, lines 52-65. According to Ma et al. some of the processing events, such as checksumming, packet classification or visitation of access list may be performed in phase I instead of phase II. Figure 8C shows an embodiment where FIB lookup and access list verification occur during phase II processing. Figure 8D shows an embodiment where access list verification occurs during phase I processing. Ma et al. further teaches that phase I should be as simple as possible to enable the packet forwarding engine to quickly determine whether or not the packet is delay sensitive. Col. 14, line 59- Col. 15, line 11.

Kakadia discloses a first network node that communicates with the network through several layers of network protocol. When a first application requests communication with a second application on another network node, the first application passes the request through several network protocol handlers, each of which modifies and encapsulates the request into another level of request before the request is passed down to a lower network protocol handler. At the lowest network protocol handler, the request is transmitted to the target application through, for example, a router, where it is decoded and passed through several network protocol handlers before it reaches the target

application. The protocol handlers have been instrumented to drive a formally specified model. An alarm monitor and event comparator of the TCP, IP and Ethernet handlers compares signals passed between these handlers the formally specified models and generates alarm messages when significant discrepancies arise. The alarm messages are passed to an event correlation module within the node. A router may be similarly modified to have a formally specified model of its own IP layer with an event comparator and alarm monitor observing deviations between expected and actual behavior. Alarm messages from the router's event comparators and alarm monitors are filtered and sent to a network management station. See at least Col. 4, line 23-Col. 5, line 55.

Applicant submits that the combination of Ma and Kakadia fails to disclose or suggest the claimed features of each of claims -8, 14, and 29-32. Independent claims 1 and 29, in part, recite an upstream flow module for providing quality of service for upstream packet flows. The Office Action alleges that modules 802 and 804 of Ma are equivalent to the upstream module recited in clams 1 and 29. However, as noted above, Ma only teaches that modules 802 and 804 perform decapsulation and classification. As previously submitted, there is simply no teaching in Ma of modules 802 and 804 providing quality of service for upstream packet flows. In the Response to Arguments section, the Office Action stated that the identification of priority and determination of whether or not a packet is delay sensitive or not is part of the quality of service act and notes that there is no requirement that the full quality of service act occur in the first module. As is known to one skilled in the art, providing quality of service is networking

terminology that specifies a guaranteed throughput level. As such, one skilled in the art understands that Quality of Service (QoS) is the idea that transmission rates, error rates, and other characteristics can be measured, improved, and, to some extent, guaranteed in advance. Based on this common knowledge, there is no teaching or suggestion in Ma of modules 802 and 804 providing quality of service for upstream packet flows. However, as indicated in applicant's previous Response, Ma only discloses that delayed sensitive packets are fully processed, wherein provision of quality of service is part of the full processing. There is no teaching or suggestion in the cited section of Ma that the full processing, including quality of service, is performed in modules 802 and 804 as alleged by the Office Action. In fact, Col. 14 lines 35+ of Ma suggests that the full processing, including quality of service, is performed in phase II, i.e., in blocks 808 and 810. Therefore, Ma suggests that when a delay sensitive packet is received, the packet is merely classified and decapsulated by modules 802 and 804 and immediately processed by modules 808 and 810 instead of being stored in the intermediate structure for later processing.

Claims 1 and 29, in part, also recite the downstream flow module for wrapping outgoing packets, wherein the downstream flow module determines whether or not to wrap outgoing packets with control information. The Office Action acknowledged that Ma does not teach that the downstream flow module **determines whether or not** to wrap outgoing packets with control information, but alleged that Kakadia provides this teaching. As noted above, Kakadia discloses that an application layer passes a request to

a physical layer through **typical** network protocol handlers, each of which encapsulates the request with information specific to that layer before the request is passed down to a lower layer. There is no teaching or suggesting in Kakadia that the network protocol handlers have the ability to choose whether nor not to encapsulate the data. Instead, as disclosed in Kakadia and known to one of ordinary skill in the art, each network protocol handler performs the customary packet handling before the packet is transmitted to a lower protocol layer. Based on the deficiencies outlined above, Applicant respectfully asserts that the rejection under 35 U.S.C. §103(a) should be withdrawn because neither Ma nor Kakadia, whether taken singly or combined teaches or suggests each feature of independent claims 1 and 29 and hence, dependent claims 2-8, 14, 31 and 32 thereon.

Claims 19 and 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Ma and in view of U.S. Patent No. 6,618,386 Liu, and further in view of Kakadia. The Office Action indicated that although Ma and Kakadia do not teach a memory means for receiving a packet pointer for a packet selected from one of a plurality of sources, the combination of the teaching of Ma, Kakadia and Liu teach all elements recited in claims 19 and 20. The rejection is traversed as being based on references that neither teach nor suggest the novel combination of features clearly recited in independent claim 19.

Claim 19, upon which claims 20-28 depend, recites a network functions module. The network functions module includes at least one flow module and at least one memory in communication with the at least one flow module. The network functions module also includes a bridging and routing module in communication with the at least one flow

module and the at least one memory. The bridging and routing module performs bridging of packets to a downstream flow module and routes the packets to and from a bus. The bridging and routing module includes at least memory means for receiving a packet pointer for a packet selected from one of a plurality of sources. The network functions module is configured to implement flow control and quality of service functions on packets in a network. The downstream flow module determines whether or not to wrap outgoing packets with control information.

As will be discussed below, the cited prior art reference of Liu fails to disclose or suggest the elements of claims 19 and 20.

Ma and Kakadia are discussed above. Liu discloses a computer system that hosts a cable modem that may be used to send and receive messages over the Internet using a cable network managed by a cable operator. See at least the Abstract.

Applicant submits that Liu fails to disclose or suggest the features in each of claims 19 and 20. Similar to claims 1 and 29 as outlined above, claim 19, in part, recites the downstream flow module determines whether or not to wrap outgoing packets with control information. Liu does not cure the deficiencies of Ma and Kakadia, as noted above. Specifically, there is no teaching or suggestion in Liu of the downstream flow module determining whether or not to wrap outgoing packets with control information, as recited in claim 19. Therefore, Applicant respectfully asserts that the rejection under 35 U.S.C. §103(a) should be withdrawn because neither Ma, Liu, nor Kakadia, whether

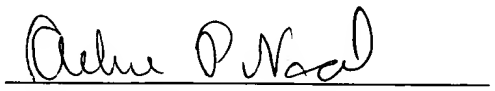
taken singly or when combined teaches or suggest each feature of claim 19 and hence, dependent claim 20 thereon.

As noted previously, claims 1-39 recite subject matter which is neither disclosed nor suggested in the prior art references cited in the Office Action. It is therefore respectfully requested that all of claims 1-39 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



Arlene P. Neal
Registration No. 43,828

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Tysons Corner, Virginia 22182-2700
Telephone: 703-720-7800
Fax: 703-720-7802
APN:kmp